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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/636,124	08/10/2000	Damon F. Kvamme	KLA1P028A	6325
22434	7590	02/24/2004	EXAMINER	
BEYER WEAVER & THOMAS LLP			PHAM, HOA Q	
P.O. BOX 778			ART UNIT	
BERKELEY, CA 94704-0778			PAPER NUMBER	
			2877	

DATE MAILED: 02/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/636,124	<b>Applicant(s)</b> KVAMME ET AL.	
	<b>Examiner</b> Hoa Q. Pham	<b>Art Unit</b> 2877	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 December 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28,35-41,44,45 and 47-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25-28,41,44,45,47 and 53-61 is/are allowed.
- 6) ☒ Claim(s) 1-4,6,7,9-18,20-24,35-40 and 48-52 is/are rejected.
- 7) ☐ Claim(s) 5,8 and 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 6-18, 20-22, 24, 35-40, and 48-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima et al (5,576,825) (of record) in view of Sanada et al (6,084,716).

Regarding claims 1-4, 6, 7, 22, 24, Nakajima et al (of record) discloses a light source (1) for emitting a light beam along an optical axis, a first set of optical elements (2,3) for separating the light beam into a plurality of beams and focusing a plurality of light beam to a plurality of scanning spots on the surface of the substrate (7); a second set of optical elements (5) for collecting a plurality of transmitted light beams caused by intersection of the plurality of beams with the surface of the substrate (7) and by passing the plurality of light beams through the substrate; and a light detector arrangement (4) including individual light detectors (pixels) that each receive individual ones of plurality of transmitted light beams, the light detectors being arranged for sensing the light intensity of the transmitted light beams (see figure 7 and column 8, lines 1-36).

Nakajima et al teaches that the device is also used for inspecting printed pattern on various other kinds of sheet materials (column 9, lines 1-7) and does not explicitly teach that the substrate is a mask, reticle or semiconductor wafer; however, such a feature is

known in the art as taught by Sanada et al. Sanada et al, from the same field of endeavor, teaches that the optical inspection system is used for inspecting mask, reticle, or wafers (column 1, lines 5-9). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the basis device of Nakajima et al for inspecting the substrate such as mask, reticle, or wafer as taught by Sanada et al.

Regarding claims 9-11, see figure 15 of Sanada et al for scanning mirrors (105, 106)

Regarding claim 12, see elements (5, 8) in figure 6 of Nakajima et al.

Regarding claims 13-18, it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the beam separator of Nakajima et al or Sanada et al by a diffraction grating or a beam splitter cube for the same purpose of separating the light beam into a plurality of light beams because they are equivalent in function. A substitution one for another is generally recognized as being within the level of ordinary skill in the art.

Regarding claim 20, see objective lens (308) in figure 12 of Sanada et al.

Regarding claims 21, 48-51, see column 23 lines 15 –22 of Sanada et al for X-stage 1002 and Y-stage 1004.

Regarding claims 22, 35-40, see column 8, lines 37-45 of Nakajima et al or column 3, line 5-7 of Sanada et al for comparison between the reference signal and scan signal.

Regarding claim 52, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange the scanning spots of Nakajima and Sanada et al by having a specified overlap and separation with respect to one another to ensure that the entire surface is scanned.

3. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Karaki et al (5,130,965).

Karaki et al (of record) discloses a light source (1) for emitting a light beam along an optical axis (B), a diffraction grating (4) disposed along the optical axis, the diffraction grating being arranged for separating the light beam into a plurality of light beam (B1, B2, B3) which are used to form scanning spots on the surface of a substrate (8), the grating spacing and rotation is controlled by controller (20, 13A). Karaki et al does not explicitly teach that each scanning spots having a specified overlap and the substrate is a mask, reticle, or wafer. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to control the space of the grating or the rotating angle of the grating so that the scanning spots having a specified overlap to ensure that entire surface is scanned. It also obvious to one having ordinary skill in the art at the time the invention was made to use the basic device of Karaki et al for inspecting the defects of a mask, reticle or wafer because the device would function in the same manner.

***Allowable Subject Matter***

4. Claims 25-28, 41, 44, 45, 47, and 53-61 are allowed.

The following is an examiner's statement of reasons for allowance:

There was no prior art found by the examiner that suggested modification or combination with the cited art so as to satisfy the combination of all the limitations in claims 25, 41, and 47.

As to claims 25, the prior art of record, taken alone or in combination, fails to disclose or render limitations **"a transmitted light prism...single transmitted light beam"** and **"a reflected light prism ...a single reflected light beam"**, in combination with the rest of the limitations of claim 25.

As to claim 41, the prior art of record, take alone or in combination, fails to disclose or render limitations **"a telescope for varying the size of scanning spots on the substrate"** and **"a prism for directing individual one of the plurality of reflected or transmitted beams to individual light detectors"**, in combination with the rest of the limitations of claim 41.

As to claim 47, the prior art of record, take alone or in combination, fails to disclose or render limitations **"a variable magnification subsystem disposed along the optical axis for controlling the scanning spot size"**, in combination with the rest of the limitations of claim 47.

5. Claims 5, 8, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

6. Applicant's arguments filed 12/23/03 have been fully considered but they are not persuasive.

a. Regarding claim 23, Applicant argues that Karaki does not teach or suggest forming scanning spots. In Karaki, the spots do not scan, but rather follow tracks, T. It is noted that the "scanning spots" can be formed by two different ways, for example, in the present application, the "scanning spots" are moved with respect to the test object or in the Karaki, the "scanning spots" can be formed by moving the recording medium with respect to the light beam spots.

b. Applicant argues that the device of Karaki does not function in the same manner as the present invention because the defects detected in the Karaki different than defects described in the present invention. Applicant is noted that the terms "defects" is so broad that could be read on anything. The defects do not have to be dust, resist flakes, skin flakes, etc.... as described in the present specification, it could be whether or not the pit has been properly recorded on the track or determining the roughness of the surface. Since the applicant does not claim specific types of the defects, the claimed language still read on the teachings of Karaki. Absence limitations may not be considered to be present.

c. Claims 2 and 3 of Karaki teach that the diffraction grid is angularly rotated. In addition, figure 4 shows that the grid is tilted (rotated) an angle ( $\theta$ ) about the optical axis. Thus, the argument in page 15 of the remarks is not deemed to be persuasive.

d. Applicant is noted that the diffraction grating in the present invention and the prior art has the same function in that it is used to separate a single light beam into multiple light beams.

e. In response to applicant's argument that there is no suggestion to combine the references (Nakajima and Sanada), the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, even though both Nakajima and Sanada inspect the surface of different objects, for example, Sanada inspects mask, reticle, or wafer and Nakajima inspects sheet material such as bills, coins, bank notes; however, they both teach that the defects are determined on the basis of comparison between the image of the test surface and a reference image (see column 5 lines 22-41 of Nakajima and see abstract of Sanada). Thus, it does not matter what kind of material to be tested, the device would function in the same manner.

In view of the foregoing, it is believed that the rejection under 35 U.S.C 102 and 103 are proper.

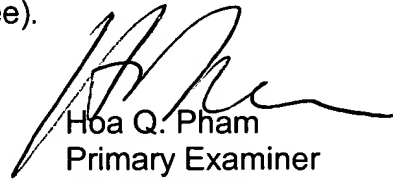
7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoa Q. Pham whose telephone number is (571) 272-2426. The examiner can normally be reached on 7:30AM to 6 PM, Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Hoa Q. Pham  
Primary Examiner  
Art Unit 2877

HP  
February 17, 2004